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# Sixteenth annual report of the agricultural experiment stations of the Louisiana State University and A. & M. College.

Louisiana State University and Agricultural & Mechanical College

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SIXTEENTH ANNUAL REPORT

OF THE

AGRICULTURAL EXPERIMENT STATIONS

OF THE

LOUISIANA STATE UNIVERSITY

AND

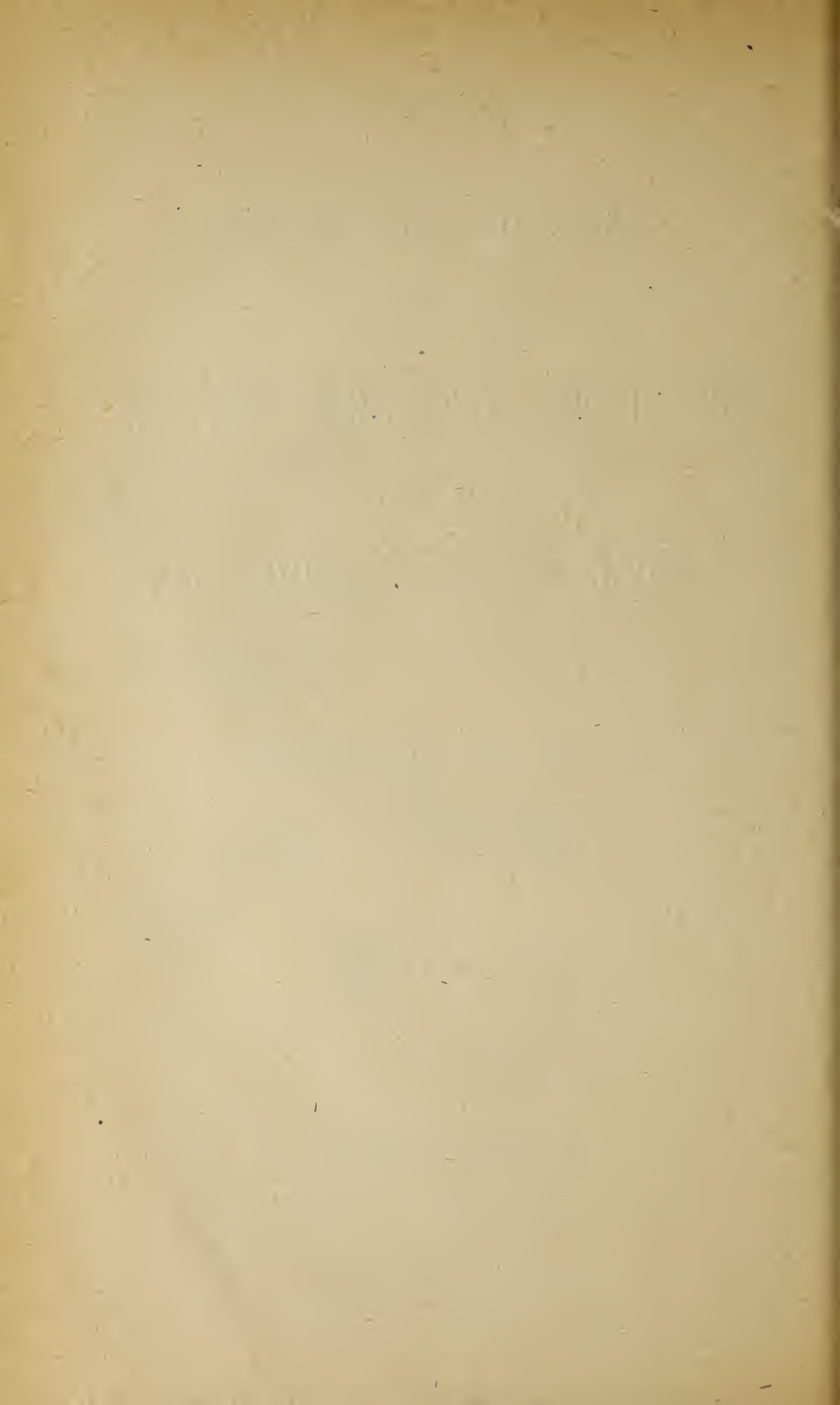
A. AND M. COLLEGE.

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FOR 1903.

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TO THE GOVERNOR.



# LOUISIANA STATE UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE.

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OFFICE OF STATE EXPERIMENT STATION.

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BATON ROUGE, LA., JAN. 24TH, 1904.

*To His Excellency, W. W. Heard, Governor of Louisiana:*

SIR—In accordance with the provisions of Section 2, of the Act of Congress, to establish Agricultural Experiment Stations in connection with the colleges established in the several States under the provisions of an act approved July 2, 1862, and the acts supplementary thereto, I beg leave to submit a report of the operations of the Louisiana Agricultural Experiment Stations, including a statement of the receipts and disbursements, from July 1, 1902, to July 1, 1903.

## STATION NO. I.

### SUGAR EXPERIMENT STATION, AUDUBON PARK, NEW ORLEANS, LA.

The work of this station during the past year has been continued mainly upon lines given in previous reports. Investigations along field, laboratory and sugar-house lines of the sugar-cane have been continued with much success. The season just closed has been remarkably unfavorable for all kinds of crops. The winter was extremely wet, prohibiting farm work of all kinds; the spring was excessively dry, preventing that preparation of soil and planting of cane so essential to large production. For a few weeks in summer favorable seasons prevailed, followed immediately by a protracted drouth extending well into harvest. Under these conditions the cane crop was materially reduced in tonnage. It was, however, of fair sucrose content and thus in a measure compensated the low field yields.

By irrigation, however, the station to a very large extent, mitigated the severity of the seasons. An early irrigation in spring placed our soils in excellent tilth, and two subsequent irrigations pushed forward all of our crops and prevented damage from the early drouth. The cane should have been irrigated again in the fall, but the frequent threatening of rain during the month of September caused almost daily a postponement of the intention to irrigate until finally it was deemed too near harvest to perform such a risky operation.

Accordingly the final yield was materially reduced by this prolonged fall drouth. However, in comparison with the average yields of the State, our results were quite satisfactory.

Again favorable results have been obtained in both the field and sugar house from seedlings Nos. 74 and 95. These canes have been supplied to a large number of planters in this State, and sufficient time having elapsed for them to judge of their merits, it was deemed of value to the sugar interests of the State to collect and correlate their experiences and opinions. Accordingly, a set of questions was sent to each in a circular letter, and the replies received, together with the results obtained on this station, have been made the basis of a communication to the Sugar Planters' Association, by my assistant, Mr. R. E. Blouin, and will later form the subject matter of a special bulletin.

It is gratifying to note the universal esteem of these seedlings, particularly D. No. 74, and the rapidity with which they are displacing other canes in this State.

It may here be remarked that T. No. 111 and T. No. 189, seedlings respectively of D. No. 74 and D. No. 95, have been this year grown in field experiments. T. No. 111 is a small cane, but exceedingly rich in sucrose, this year giving 17.2 per cent, for plant and 18.5 per cent. for stubble. T. No. 189 is a cane of fair size and sugar content. Both are continued in cultivation with the hope that they will prove valuable additions to our fields.

The station is paying unusual attention to the proper preparation of the soil and the fertilization and cultivation of the cane, since it is realized that only by the practice of the best and most economical methods can our planters successfully withstand such adverse seasons as have prevailed during the past four or five years.

The recently enacted reciprocity treaty of this country with Cuba



promises a vigorous development of the sugar industry in the "Gem of the Antilles," and with it a depreciation of present values. To successfully meet this strong competition every known economy must be practiced by our planters.

Dr. C. A. Browne, Jr., has continued his laboratory investigations of the sugar cane. Special attention has been paid to a study of the insoluble carbohydrates of the cane, likewise to the composition of cane fibre and its utilization for paper making. The commercial manufacture of paper from bagasse has thus far not proved a pronounced success, as large losses of fibre are entailed with present processes. This is to be lamented, as cane fibre has most superior paper-making qualities. A process, however, has recently been patented by which all losses of fibre are prevented and a small practical test by a modern paper company has shown that bagasse is capable of being worked up into the very finest grades of paper, some of which can bring as high as \$300 a ton. A similar test is now being conducted on a larger scale, and if the results prove successful we may hope for the establishment of several paper mills in the sugar producing sections of our State.

Among other laboratory investigations, the action of enzymes, or natural ferments, during the ripening and windrowing of cane, and the concomitant changes in the composition of the juice have been studied. The losses from the fermentation of cane juice, by yeasts, moulds and bacteria, have also been investigated. During the past grinding season several different methods of extraction were tested, with special reference to the composition of the juice from each mill. The station has also recently taken up the study of another very important question bearing upon the sugar industry, viz.: That of the composition and feeding value of mixed feeds containing molasses. The manufacture of these feeds is attracting much attention at present, and the industry gives promise of assuming considerable importance, since it offers our planters a greater market for their surplus molasses, as well as a more convenient means of feeding this by-product.

#### ORANGE CROP.

Greatly to our disappointment, the hybrid orange trees in our orchard, crosses between the hardy trifoliata and the edible oranges, failed last year to fruit. The success obtained elsewhere emboldens

us to hope for an edible fruit from some of our numerous trees in the near future.

## FIBRE CROPS

are still grown on this station, but in reduced areas, since the successful decoraticating machine, so long promised by inventors, has not yet appeared.

## COTTONS.

It is with deep regret that we have to chronicle the destruction last summer of all the varieties of cotton grown on this station. Some miscreant placed in our field the Mexican boll weevil, and to successfully exterminate it when found in August last it was deemed necessary to destroy every stalk of cotton on the station. The cottons were pulled up by the roots, immersed in petroleum and burned. The fallen bolls and squares were carefully picked up, saturated with petroleum and also burned. Petroleum was sprinkled over the soil, after which the latter was carefully plowed, harrowed, rolled and oiled, reharrowed, rerolled and reoiled. Then the land was flooded and kept under water for five days. The weevils were thus exterminated, but at a great sacrifice and large cost. Nearly one hundred varieties, secured from Egypt, India, Japan and this country, at a great cost of time and money, were destroyed in a few days.

Pedigreed cottons upon which the labor of years had been devoted in order to combine productiveness with excellence of staple and vigor of growth, were consigned with the rest to the flames.

## FORAGE CROPS.

Experiments have been continued with most of the crops reported last year. Some few new plants were tried. While many forage crops can be grown here successfully, none are equal in quality and quantity produced to that peerless plant, alfalfa, which should be grown upon every farm and plantation in the State. Upon the alluvial lands it will grow well without inoculation. A thorough preparation of the soil and a successful seeding in October is all that is needed to insure fine crops in these soils. Elsewhere heavy fertilization, with inoculation, may be required before good crops can be secured. Bulletin No 72 on forage crops, recently

issued by the station, gives full directions for the planting and harvesting of this crop.

### SUGAR SCHOOL.

During the past fall twelve students from the Audubon Sugar School of the Louisiana State University were given instruction in practical work by lectures and experiments in the field, laboratory and sugar house.

It is to be regretted that the demand for trained scientists is so great and the salaries offered so large, as to induce many of these students to enter into commercial work before finishing their regular course.

### STATION NO. 2.

State Experiment Station, Baton Rouge, La., continues to perform most excellent work under the direction of Prof. W. R. Dodson.

Experiments in the proper fertilization of corn and cotton have been continued. A large number of varieties of corn and cotton were tested and samples of each have been procured for the Louisiana State exhibit at the World's Fair in St. Louis.

A number of forage crops have been grown for the purpose of supplying the large and valuable herds of Hereford and Polled Angus cattle with feed.

### BEEF CATTLE IN CHICAGO MARKET.

Mention was made in our last report of the grade Aberdeen Angus calves bought in November, 1901, in Illinois, and successfully immunized. It was then stated that the steers, sixteen in number, were being fed upon the by-products of our three great staples, viz., cotton seed meal, rice bran and molasses, with a view of preparing them for the Chicago market. It is a great pleasure to report further that these steers were during the past winter "finished up" for the market and sold on January 8 in Chicago at the top price for the week, fetching \$5.65 per hundred pounds. It required six days to transport the carload of steers from Baton Rouge to Chicago. This delay in their journey, added to inadequate feed and water during the trip, and the very severe weather encountered, caused a reduction in weight and a slight decline in



price. However, the results were very gratifying, and proclaimed to the world that as good beef could be produced upon the comparatively cheap by-products of this State, as upon corn raised upon the prairies of Illinois and Iowa, with their famous blue grass pastures thrown in. In addition to a balanced ration of cotton seed meal, rice bran and molasses, these animals were grazed upon the pastures in spring and summer and fed ad libitum upon the hay grown upon the grounds of the station. This sale in Chicago has attracted the attention of many Western feeders and elicited comments from nearly every Northern agricultural journal.

The station will undertake the feeding of a lot of steers, raised below the quarantine belt, at an early date, and hopes to prove conclusively to all concerned that beef cattle can be more economically and profitably produced in Louisiana than elsewhere.

#### DIGESTIBILITY OF RICE BRAN AND POLISH.

Mention was made in our last report of the experiments then being conducted of determining the digestibility of rice bran and polish. These experiments were brought to a successful conclusion and the results embodied in Bulletin No. 77, just issued. A fact was brought out in these experiments which was not sought, because it was not suspected. It was a valuable revelation, however, and the strong hand of the law may be invoked to suppress its future existence. It was found that it was a common custom of the rice mills in this State to grind up the hulls of the rice and mix the same with the bran. In many instances this adulteration reached 50 per ct. of the total feed. By the new process of milling rice it is claimed that a small quantity of hulls necessarily finds its way into the bran, but so large a quantity as 50 per cent. can only be accounted for by mixing of the two with the intention of fraud. Rice hulls are not only of no nutritive value, but absolutely injurious from a physiological standpoint, greatly injuring the mucous linings of the stomach.

In connection with the investigations upon bran and polish, it was observed that the high percentage of oil in the same had a bad effect upon the properties of the feeds. The oil speedily becomes rancid, thus rendering the feed unpalatable to the animal; in addition to this defect, the oil diminishes the digestibility of the feed and also exerts a purgative action upon the bowels, if the bran is

fed in large amounts. To remedy these defects in the rice feeds it is proposed to remove the excess of oil. Co-operative experiments are at present conducted by the Experiment Station with the Pratt Cereal Mill Co., of Decatur, Ill. It has been found that the rice bran is much improved in quality after removing the excess of oil and does not become rancid. The oil which is obtained has a considerable commercial value which will more than pay for the process of its removal. The outlook is so favorable that we may soon look for the establishment of several mills in Louisiana for the extraction of rice oil and the manufacture of improved feeds from rice. There is every reason to believe that such improved feeds can replace to a large extent the corn and wheat products which are now being shipped into our State from the North and West.

### TOBACCO.

During the past year experiments in growing Havana and Sumatra tobacco in the open and under half shade, have given good results.

This tobacco, after being carefully cured, is now being manufactured into cigars, which have been pronounced by experts to be of good quality. Both the tobacco and cigars will be shown in the Louisiana exhibit at St. Louis.

During the past year Prof. H. A. Morgan has continued his valuable experiments with various mixtures for spraying cattle with a view of killing the ticks and of repelling the horn-fly, both serious obstacles to the welfare of stock in the summer.

Since our last report the Mexican boll weevil has made its appearance in several localities in the western portion of this State (Sabine Parish). A crop pest commission has been created by the Legislature, with authority to deal with this and other pests to our crops. The director of the station and the station entomologist are made "ex-officio" members of this commission. Prof. Morgan at a late meeting was made entomologist and secretary of this commission, and has vigorously entered upon his duties. His headquarters have been temporarily located at Shreveport, and with his assistants and inspectors is now preparing a vigorous campaign for keeping the weevils out of this State.

Dr. W. H. Dalrymple has, during the past year responded to many public calls for stamping out contagious and infectious dis-

eases. He has also continued his investigations of the nodular worms in sheep, and has shown that infected pastures may be cleaned by a careful rotation of crops. A bulletin now in press will give results of his investigations. Dr. Dalrymple has been again honored by a re-election as vice-president of the National Veterinary Association of America.

The Horticultural Department has supplied an exhibit of fruits and vegetables for the Louisiana exhibit at the Louisiana Purchase Exposition, St. Louis.

### STATION NO. 3.

North Louisiana Experiment Station, Calhoun, Louisiana, had upon the whole a fairly good season. The spring was late and dry, reducing the earlier crops. The cotton crop was, however, fair, and the prevailing prices for this staple made its culture last year quite remunerative. Field experiments with corns, cottons, forage crops, small grains and tobacco were conducted. Twelve varieties of wheat were again successfully grown, and the fact has been demonstrated that upon the red lands of North Louisiana this cereal could be profitably grown, provided a near market could be found for its sale, or factories could be established in various localities where it could be made into flour.

Rust-proof oats and barley sown early in October, afford an excellent pasture for stock during the winter, and if they be withdrawn early in March, fair crops of oats and barley will be produced.

Dwarf Essex rape also affords a valuable fall and winter pasture. Alfalfa, red and crimson clovers, planted with care in October, will furnish cuttings of most nutritious hay. Crimson clover yields only one crop; red clover frequently two or more, while alfalfa, when well established and carefully harvested, will last for years, affording four to five crops per annum. A number of saccharine and non-saccharine sorghums can be successfully grown in this section, affording two or more cuttings per year. Cow peas, velvet beans and Spanish peanuts are largely grown and furnish, when well cured, most valuable forage. A vast array of forage and grazing crops can be grown here, both in winter and summer, and with them, supplemented by cotton seed, or preferably, cotton seed meal, stock of all kinds can be profitably grown—beef and mutton for home and Western markets, hogs for local consumption, and



mules and horses for home use. Besides, dairying as already fully demonstrated by our model dairy, could be made a valuable adjunct to many farms. The station has the following breeds of cattle; Jerseys, Guernseys, Devons and Red Polls, and the increase, especially in the male line, is supplied to the farmers of North Louisiana at reduced prices. It has on hand now, young bulls of the following breeds, Jersey, Devon and Red Poll.

The following breeds of hogs are grown, Berkshire, Poland China, Essex and Red Jersey. The pigs from these breeds are sold to the farmers of the State at low figures.

Of the following breeds of sheep experimented with, viz., Dorset, Shropshire, Southdown and Merino, the last appears to succeed the best. Stomach worms, the great enemy of sheep raising, have been very destructive of our flocks. The Merino breed seems to be the most resistant to the attacks of these insects.

By a frequent change of pastures or giving an extensive range for grazing, these parasites are greatly reduced.

The young orchard on the station is growing finely, though the season was destructive of the fruit crop last year. It is hoped that a favorable season the present year will give us abundant fruitage and afford an opportunity of studying the different varieties under cultivation.

## TRUCK GROWING.

Considerable interest has been developed in the "truck" industry in this section, and the garden will accordingly be expanded the present year to meet this interest. Truck growing upon a somewhat enlarged plan will be conducted with the leading vegetables, in order to test the yields per acre and the prospective profits of this industry.

## TOBACCO.

A fine crop of yellow leaf tobacco was grown the past year. It has been clearly demonstrated that this type of tobacco can be successfully grown upon the hill lands of North Louisiana, and only local factories are needed to induce an extended cultivation of this plant. The impetus given to the cultivation of this plant years ago, was checked by the burning of the factory located at Calhoun, but this factory was in existence sufficiently long to demonstrate

the excellence of the tobacco grown and the willingness of the farmers to grow it within the reach of local factories. Fine samples of the tobacco grown last year will be exhibited in the State exhibit at the Louisiana Purchase Exposition.

North Louisiana Agricultural Fair and Camp Meeting continues to hold its annual session of three days in the fall of each year. Last year it was held on November 4, 5 and 6, and was well attended, particularly on the second day. The exhibits were good and fairly numerous. The best of order prevailed and everybody enjoyed the occasion.

### STATE GEOLOGICAL SURVEY.

Prof. G. D. Harris, aided by Mr. A. Reinecke, is now in the field completing the work necessary for furnishing the biennial report, which will be issued early in April. This report, besides giving the general geology of the State, will deal specially with the subterranean waters and oil deposits of this State. Very valuable data have been obtained from the logs of the wells dug all over the State which has served to more clearly elucidate the geological history of the State.

The lignitic beds mentioned in our last report, will be fully treated in this volume. Already these beds have attracted the attention of the capitalist, and it is now believed that they will be developed and worked in the near future.

### CO-OPERATION OF UNITED STATES COAST AND GEODETIC SURVEY.

For several years past the United States Coast and Geodetic Survey has been co-operating with this survey in determining the magnetic influences and establishing a permanent North and South line at the various parish seats. Mr. L. B. Smith is now at work, and contemplates completing it early in March. When completed, every parish in the State will have a permanent North and South meridian, from which the surveyors can easily determine the variation of their magnetic needles. With increasing values of land all over the State, the question of exact meets and bounds becomes prominent, and accurate surveys are now everywhere demanded. Each parish surveyor has now a ready reference for the estimation



of the variation of his needle. It has been found that this variation is almost the reverse of that found further east.

This survey is under obligations to the numerous police juries for the readiness with which they supplied the necessary materials, and other valuable co-operation.

### SOIL SURVEY.

Allusion was made in my last report to the generosity of the Bureau of Soils (Prof. Milton Whitney, chief) of the Department of Agriculture, Washington, D. C., in assigning us a corps of men to make a soil survey of this State. The schedule given in my last report, slightly modified, has been fully carried out. Prof. T. D. Rice, with his assistants, has surveyed and mapped during the past year, the entire parishes of Ouachita and Arcadia, and 400 square miles around New Orleans. Mr. Rice has been supplanted by Mr. Jones, who with assistants, is now making the survey of De Soto parish. This survey will continue its work during the present year, going into other parishes after completing De Soto. The soils of each parish are classified, carefully analyzed chemically and physically, and the adaptability of each type to certain crops, as shown by examination, pointed out. Maps of the parish surveyed will accompany the report.

The entire expense of this survey is borne by the United States Department of Agriculture, and the results of the work furnished our State Geological Survey.

### UNITED STATES GEOLOGICAL SURVEY.

Mention was made in our last report of a contract made by the director of this station with this survey, by which a quadrangle included between  $30^{\circ} 31'$  and  $30^{\circ}$  latitude and  $91^{\circ}$  and  $91^{\circ} 30'$  longitude, shall be mapped out upon a scale of 1:125000, showing the courses of the drains, bayous, etc., hypsography and public culture, including location of farm houses, roads, towns and country boundaries. The townships and sections of the land surveyed will be accurately given. The heights of important points will be determined, and at least one permanent bench mark established in each township. All outlines of wooded areas will be represented on the map. Upon the completion of the survey, the station

will be furnished copies of the manuscripts and transfers from the copperplates of the maps for use in printing its own edition of said map.

This survey began in March 1903, and the following preliminary report made by Charles D. Walcott, director of the United States Geological Survey, shows the work done to date:

“DEPARTMENT OF THE INTERIOR, UNITED STATES GEOLOGICAL  
SURVEY.

“WASHINGTON, D. C. JANUARY 27, 1904.

“Dr. Wm. C. Stubbs, Director,  
Louisiana Experiment Station,

Audubon Park, New Orleans, La.

“SIR:—I have the honor to make the following preliminary report of the results of the co-operative topographic survey conducted in the State of Louisiana during the year 1903. This work was prosecuted under an agreement signed by you February 16, 1903, and by me February 13, 1903, whereby it was agreed that not more than \$2500 was to be expended by you towards the co-operative work, to be met by a like sum by me on behalf of this bureau, all expenses to be balanced not later than July 1, 1904.

“Under the direction of Mr. J. H. Renshawe, geographer, field work was commenced in March on the Bayou Sara quadrangle, lying in portions of the parishes of East Baton Rouge, West Baton Rouge, Pointe Coupee, East Feliciana and West Feliciana, and continued through May. It was again resumed in September, 1903, under the general direction of Mr. H. M. Wilson, geographer, under whose supervision the field work of the central section had in the meantime been placed. This latter work extended into the Baton Rouge quadrangle, which is included in portions of the parishes of Ascension, Assumption, Iberia, St. Martin, Iberville, East Baton Rouge and West Baton Rouge.

“In view of the great detail encountered in mapping the topography in the northern portion of the area under survey, the total funds allotted were exhausted early in November, 1903. I therefore allotted an additional \$2500 from the funds of this bureau, thus making a total of \$7,500 allotted to this work, of which this bureau provided \$5,000. With these additional resources field work

was continued until the close of December, when it was temporarily disbanded during the colder months of the winter.

"From the expenditures made there has resulted 81 miles of primary traverse for the control of one atlas sheet, covering an area of 1025 square miles.

"In addition to the above primary control there has resulted an accurate map on a scale of 1:125000 and with a contour interval of 20 feet, of 486 square miles of the area of the State, 401 of which lie within the Bayou Sara quadrangle, on which 690 miles of spirit levels were run, in the course of which 16 permanent bench marks were established and 1761 elevations determined. In addition there were run 2014 miles of traverse, at an expenditure for field work alone of \$3775. In addition to the work above mentioned on the Bayou Sara quadrangle there were mapped 85 square miles of the Baton Rouge quadrangle; there were run 173 miles of levels, in the course of which 1 permanent bench mark was established and 435 elevations determined.

"There were run 290 linear miles of road traverse. The cost of field work alone on this sheet has been \$850. The results will be published on parts of the two sheets above named.

"Besides the final mapping mentioned the remainder of the Bayou Sara quadrangle, covering 624 square miles, was completely traversed, levelled and adjusted, and is ready to be sketched.

"The total expenditure by the State funds to date of January 15, 1904, has been \$2,840, leaving a balance of State funds to the amount of \$20. The total expenditure by the Federal Bureau to the same date has been \$3,737, leaving a balance of \$3,763 to co-operative work. There will remain at the beginning of the next field season an estimated balance of \$600, the remainder being needed for office salaries and drafting during the coming winter."

"Very respectfully,

(Signed)

"CHAS. D. WALCOTT,

"Director."

The demand for the publications of the survey is very large, both from our home people and from prospective settlers and investors. Copies are furnished free upon application to the Director of the station.

## FARMERS' INSTITUTES.

The staff of the three stations has taken an active part in the Farmers' Institutes held since my last report.

## ANALYSES OF FERTILIZERS AND PARIS GREEN.

The official work performed in the laboratory of the station during the past year has again increased, 4,240 samples of commercial fertilizers, and 83 samples of Paris Green sent by the inspectors of the State Department of Agriculture, having been received and analyzed. This work has been greatly increased by the inclusion of cotton seed meal (when used as a fertilizer) under the provisions of the Fertilizer Act. It required a number of chemists to satisfactorily dispatch it. A bulletin giving the results of this work has been issued.

## OTHER WORK.

Besides the official work given above the station has performed 95 analyses of the following substances:

Waters .....	23
Lignite and coal.....	3
Cotton seed oil.....	2
Rice bran and polish, molasses foods, and other food products..	21
Miscellaneous .....	46

In the analyses of the rice bran there has been found in every instance a large percentage of rice hulls, added as a filler, materially reducing the food value of the bran, and besides this the presence of these hulls are very injurious to the digestive organs of the animal, and may cause the loss of the animals. In a number of these analyses over 50 per cent. of hulls were found in the bran, thus reducing its value 50 per cent., and at the same time rendering it a dangerous stock food. State inspection of these food products should be obtained in order to remove this dangerous practice and imposition. An inspection law, similar to the fertilizer law now in operation, seems to be an urgent necessity in order to protect purchasers against fraud in feed stuffs. The markets are flooded with various compounds, claiming to furnish the highest nutrition in the best available forms, and their real value can only be determined by analysis. Our next legislature will doubtless



be called upon to enact legislation necessary to protect our planters and farmers from fraud.

## LOUISIANA PURCHASE EXPOSITION.

It was determined by the last Legislature to make a presentation of Louisiana's resources at the centennial celebration of the Louisiana Purchase in St. Louis during the present year. A commission, consisting of your Excellency, Col. Charles Schuler of De Soto, Judge Emile Rost of St. Charles, Hon. Henry L. Gueydan of Vermillion, and Maj. J. G. Lee, Commissioner of Agriculture, Baton Rouge, met early in last year and elected the director of the stations as State Commissioner, and Mr. Robert Glenk as Assistant to the Commissioner.

Since that time a large portion of the time and energies of the director has been spent in collecting the exhibits and arranging for their proper installation at St. Louis.

Very gratifying results have been obtained. A replica of the Cabildo or Supreme Court building in New Orleans, in which the actual transfer of Louisiana from the French to the United States took place, has been erected on the World's Fair grounds at St. Louis, to be used as a State building. It will be furnished with antique furniture of Colonial and Empire styles, and in its front will be a reduced reproduction of Jackson Square (the old Place d'Armes). Exhibits will be made in the following buildings. Agriculture, Horticulture, Forestry, Fish and Game, Education, Mines and Minerals, Liberal Arts, Transportation, and Archaeology.

In agriculture will be presented complete exhibits of the processes for preparing for market our three chief staples, sugar, rice and cotton, together with all of their products.

A complete model, upon a scale of one inch to the foot, of a sugar house capable of working 1,000 tons of sugar cane per day, has been secured. The following are the contributors:

B. F. Avery & Sons, model plows, cultivators, etc.

Baldwin Locomotive Works, 1 model locomotive.

T. J. Howard, 1 cane loader.

Bodley Manufacturing Co., 1 cane feeder.

Whitney Iron Works, 1 mill with shredder, engines and carriers.

Sterling Boiler Works, 1 battery of boilers.



Wm. B. Perrin & Co., 1 set mud filter presses.

John H. Murphy, sulphur machine and tank, lime tank, juice and syrup tank, clarifiers, brush pans, triple effects, and vacuum pans.

S. S. Hepworth & Co., mixer and five centrifugals.

Whitney Iron Works, crystallizer.

Hersey Granulating Co., granulator.

A wax cane field, showing the field in all conditions, from the planting of the cane to the harvesting of the same, cars, barrels of sugar and molasses have been provided by the Commission. Over all of this machinery will be an up-to-date sugar house, built also at the expense of the Commission. To the above will be added all the commercial samples of molasses and refined and unrefined sugars (furnished by the Sugar Exchange, and American Sugar Refinery) candies, alcohols, vinegars, etc. A sugar laboratory and samples of cane, etc., complete the sugar exhibit.

In the Rice Exhibit, will be a rice field in all stages, from the preparation of the soil to the harvesting of the matured rice. A complete rice mill made by Boland & Gschwind; a complete pumping plant made by A. M. Lockett; rice plows and wagons by John Deere Co.; a rice drill by Monitor Drill Co.; a rice harvester by International Harvester Co.; a thresher by Case Manufacturing Co.; two rice warehouses, sacks of rice, etc., complete the outfit. The following have contributed also to the Rice Exhibit:

Kahn & Co., rice products and by-products.

M. C. Mevers, rice in sheaf.

In the Cotton Exhibit are a number of bales of cotton kindly loaned by progressive citizens over the State. A carnival King Cotton, a saw gin, a roller gin; a complete oil mill furnished by the Buckeye Iron & Brass Works; a square cotton press; a Lowry press, and a number of round bales of cotton; and products of the oil mill and cotton factory.

Besides these exhibits in the three staple crops, there will be included a fine general agricultural and vegetable exhibit.

## HORTICULTURE.

Will consist of all of the fruits of the State, both preserved and fresh. A large display of pecans, oranges, grape fruit, etc. A number of orange and grape fruit and pecan trees will be exhibited in boxes. Also bananas, figs, pineapples, pomegranates, growing

in boxes will be in evidence. In the floral display will be a handsome collection of palms and other rare plants.

### FORESTRY.

Every tree of our forests will be presented in the form of a log, and at the same time in boards polished and unpolished. The products of the forest covering every article known to be made in the State have been secured, together with highly polished doors, mantels, etc., of our cypress and pines.

### FISH AND GAME.

A contract has been made to furnish every bird, fish and animal found in Louisiana, and the progress so far made gives token of a compliance with the contract.

### EDUCATION.

Many of the public schools, some of the private schools, and nearly all of the higher institutions of the State, have furnished creditable exhibits for this department.

### MINES AND MINERALS.

Sulphur and salt in goodly quantities, petroleum from every well in the State, refined products of petroleum from our local refinery, coal from DeSoto, marble from St. Landry and Winn, sandstone from Natchitoches, iron ores from Lincoln, clays, bricks, etc., constitute our exhibit in this building. A heroic statue of Mephistopheles, and a Cleopatra's Needle twelve feet high, both of sulphur, and Lot's Wife of salt, will be attractive features.

### LIBERAL ARTS.

Topographical maps of New Orleans in 1803 and 1903 have been prepared. The former is two feet square. The latter is 15 feet square, and shows clearly the streets, public buildings, railroad approaches, elevators, wharves, river front, etc. A topographical map of the levees of the State is 35 feet long and 40 inches broad and shows in detail the vast extent of levees in the State, and the relative height of same. A number of maps showing the Louisiana Purchase extending from the year 1500 up to the present time, and a number of rare old books, will be exhibited here, through the kindness of Mr. William Beer, of the Howard

Memorial Library. A working model of the Algiers Dry Dock has been prepared for the Louisiana Exhibit by the Maryland Steel Company, the builders of the dry dock.

## TRANSPORTATION.

In this building will be presented transportation on the Mississippi River, past and present. Beginning with the pirogue, the flatboat propelled by oars, the sail vessel, the original steamboat, the Mississippi steamer and the large ocean steamship are all shown in handsome models. The Southern Pacific Co., the Leland Line, The Harrison Line, The Copenhagen Line, and the Mexican Steamship Co., have all furnished models of steamers that at present are engaged in the trade of New Orleans.

## ARCHAEOLOGY.

A select collection of Indian relics, baskets, etc., will be exhibited in this building.

## TOPOGRAPHICAL MAPS OF THE STATE.

Under the auspices of the Geological Survey of the State, three large topographical maps of the State have been prepared. One will show the geology of the State and location of minerals, oils, etc.

Another will show the argiculture of the State, the different areas devoted to the different crops, etc.

The third will show the forestry, clearly delineating the long leaf pine, the short leaf pine, the cypress and the hard-wood areas of the State.

The first will be in the Mines and Minerals Building. The second in the Agricultural Building. The third in the Forestry Building. These maps are costly and exceedingly valuable for the information they convey.

I have gone somewhat into detail in giving the above, in order that some idea may be obtained of the magnitude and quality of this collection.

At the end of this exposition, this collection should be kept together and form the nucleus of a State Industrial Museum. A large and well ventilated building should be secured where these exhibits could be displayed and where both the citizens of this

State and the stranger within our gates, could in a short while see the products of our State and form some idea of the immense resources of Louisiana. This museum should have for its curator, a naturalist of decided ability, and should be maintained by the State, and opened at all reasonable hours for the inspection of visitors. Such a museum centrally and suitably located in New Orleans, would do more to advertise the State than any other single agency. Besides, it would furnish material for future fairs and expositions.

### STAFF OF THE STATIONS.

Since my last report several changes have taken place in the personnel of the stations. Prof. H. A. Morgan, who has heretofore filled the positions of Professor of Entomology in the Louisiana State University, and entomologist to the stations, has on account of the increased duties of the latter position, resigned the former and will hereafter devote his entire time to station work. Messrs. Esnard, Loudon and Taylor have resigned to accept more lucrative positions. Their places have been filled by T. W. Holmes, of Mississippi, Geo. H. Hardin, of Maryland, and Jas. E. Halligan, of Massachusetts, three good men. Mr. R. S. Washington has been succeeded by Mr. D. L. Williams, of Georgia, as Farm Manager. Mr. C. E. Smith on account of bad health, has resigned, and Mr. E. Reinecke is now Assistant Geologist. Mr. Geo. Chiquelin has been granted a leave of absence for five months, to superintend a large sugar house in Cuba, during the grinding season. Mr. Simon Baum has resigned as chemist of the North Louisiana Experiment Station, and entered upon private enterprises. Mr. H. Peavy has been succeeded by Mr. Ivy Watson, as Farm Manager at Calhoun. Mr. Watson was previously connected with this station in this capacity and performed satisfactorily its duties. Mr. Travis McLendon has been succeeded by Geo. H. Malone as dairyman at Calhoun.

The position of tobaccoist has not yet been filled.

It may here be remarked that so great is the demand for graduates of our own University, that it has been found impossible to employ enough of them to fill the vacancies as they occur on the stations. Larger salaries with prospects of future promotion, and private enterprises of an attractive character lure them into other fields.

The demand for the publications of the stations has grown



beyond our capacity to supply. Fifteen thousand copies are issued of each bulletin and our regular mailing list absorbs most of these, leaving but few for future applicants. Applications from other States and foreign countries to be placed on our mailing list are received almost daily. Many of these we are compelled to decline on account of the limited supply. Again, several of our popular bulletins have had to be re-written and re-published in order to meet the demand for the information which they contained. In one instance, a third edition has been issued.

The following constitute the present staff of the stations:

#### SUGAR EXPERIMENT STATION NO. 1,

Postoffice, Audubon Park, New Orleans, La.

William C. Stubbs, Ph. D., Director.

R. E. Blouin, M. S., Assistant Director and Chemist.

P. L. Hutchinson, B. S., Chemist.

C. A. Browne, Jr., Ph. D., Chemist.

Geo. H. Hardin, B. S., Assistant Chemist.

T. W. Holmes, B. S., Assistant Chemist.

Jas. E. Halligan, B. S., Assistant Chemist.

G. D. Harris, M. S., Geologist.

E. F. Lines, Assistant Geologist.

A. Reinecke, Assistant Geologist.

Geo. S. Chiquelin, Chemist and Sugarmaker.

D. L. Williams, Farm Manager.

Jas. K. McHugh, Secretary and Stenographer.

#### STATE EXPERIMENT STATION NO. 2,

Postoffice, Baton Rouge, La.

William C. Stubbs, Ph. D., Director.

W. R. Dodson, A. B., S. B., Assistant Director, Botanist and Bacteriologist.

C. E. Coates, Ph. D., Chemist.

H. A. Morgan, B. S. A., Entomologist.

F. H. Burnette, Horticulturist.

W. H. Dalrymple, M. R. C. V. S., Veterinarian.

B. H. Atkinson, Farm Manager.

H. Skolfield, Treasurer.



## NORTH LOUISIANA EXPERIMENT STATION NO. 3,

Postoffice, Calhoun, La.

William C. Stubbs, Ph. D., Director.

D. N. Barrow, B. S., Assistant Director.

Ivy Watson, Farm Manager.

E. J. Watson, Horticulturist.

\_\_\_\_\_, Tobacconist.

Geo. H. Malone, Dairyman.

At the end of this report will be found a correct exhibit of the receipts and expenditures arising from the Hatch Bill for the fiscal year ending June 30, 1903. It shows that expenditures have equalled receipts.

There is also given a supplementary statement of receipts from all sources and expenditures of every kind.

All of which is respectfully submitted. WM. C. STUBBS,

*Director.*

## FINANCIAL STATEMENT.

1903.	Cr.	Dr.
The receipts from the Treasurer of the United States for the year ending July 1, 1903 .....		\$15,000.00
By Salaries .....	\$ 7,120.51	
Labor .....	3,196.33	
Publications .....	1,423.50	
Postage and Stationery.....	383.01	
Freight and Express.....	205.39	
Heat, Light and Water.....	226.90	
Chemical Supplies.....	86.54	
Seeds, Plants and Sundry Supplies...	311.85	
Fertilizers .....	152.49	
Feeding Stuffs.....	708.78	
Library .....	287.71	
Tools, Implements and Machinery....	578.93	
Scientific Apparatus .....	26.71	
Live Stock.....	291.35	
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	\$15,000.00	\$15,000.00

We, the undersigned members of the Board of Agriculture and Immigration, to whom is entrusted the disbursement of the above funds, do certify that we have examined the accounts of the Experiment Station of the Louisiana State University and Agri-

cultural and Mechanical College, for the fiscal year ending, June 30, 1903, and have found the above classification to be correct, and the receipts for the time named are shown to be \$15,000.00, and the corresponding disbursements are \$15,000.00, for all of which the proper vouchers are on file, and have been examined by us and found correct.

(Signed)

J. G. LEE,

*Commissoner of Agriculture and Immigration.*

WM. GARIG,

*Vice President Board of Supervisors and Ex-Officio Member of Board of Agriculture.*

### SUPPLEMENTARY STATEMENT.

To receipts from other sources than the  
United States, for the year ensuing  
July 1, 1903:

	Cr.	Dr.
To balance, July 1, 1902.....		\$11,209.99
State Appropriation.....		15,000.00
Geological Survey.....		5,000.00
Fertilizer Fund.....		10,000.00
Farm Sales.....		1,869.30
Miscellaneous Receipts.....		8.63
		<hr/>
		\$43,087.92
By Salaries.....	\$8,400.61	
Labor .....	3,326.93	
Freight and Express.....	213.79	
Heat Light and Water.....	240.25	
Chemical Supplies.....	90.09	
Seeds, Plants and Sundry Supplies..	324.59	
Fertilizers .....	158.73	
Feeding Stuffs .....	737.92	
Tools, Implements and Machinery...	602.57	
Furniture and Fixtures.....	85.00	
Traveling Expenses.....	143.90	
Contingent Expenses.....	2,425.93	
Buildings and Repairs.....	1,096.81	
Insurance .....	143.80	
Geological Survey.....	5,000.00	
Fertilizer Fund .....	10,000.00	
	<hr/>	
		32,990.92
By balance, July 1, 1903.....		\$10,097.00

